Guideline Essentials:

American Heart Association Clinical Slide Series

ADAPTED FROM:

2026 ACC/AHA/ACCP/ACEP CHEST/SCAI/SHM/SIR/SVM/SVN Guideline for Evaluation and Management of Acute Pulmonary Embolism in Adults

American Heart Association.

AHA Clinical Update PPTX

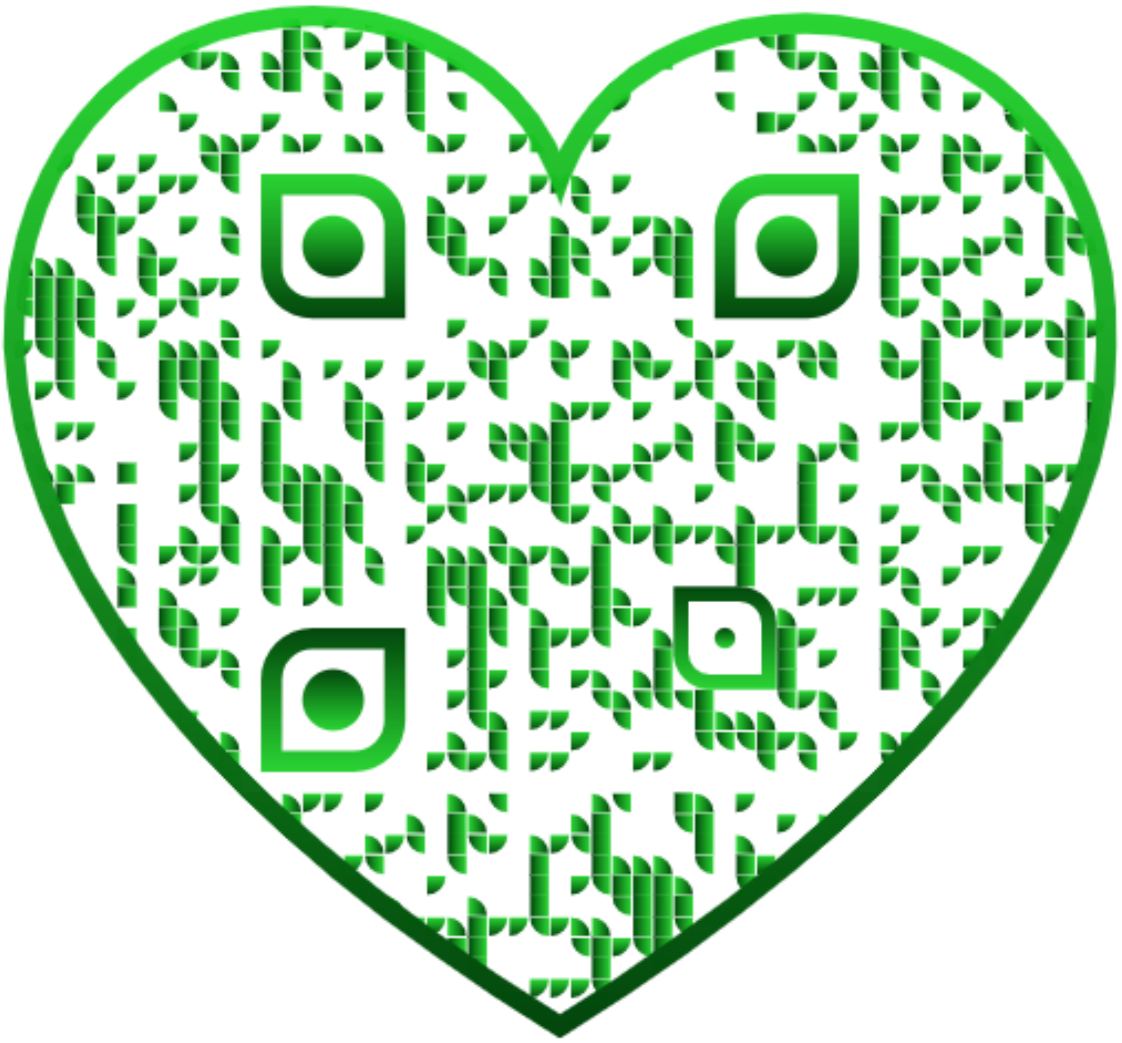

Table 1. Applying Class of Recommendation and Level of Evidence to Clinical Strategies, Interventions, Treatments, or Diagnostic Testing in Patient Care

CLASS (STRENGTH) OF RECOMMENDATION

CLASS 1 (STRONG) — Benefit >>> Risk

Suggested phrases for writing recommendations:
- Is recommended
- Is indicated/useful/effective/beneficial
- Should be performed/administered/other
- Comparative-Effectiveness Phrases†:
  - Treatment/strategy A is recommended/indicated in preference to treatment B
  - Treatment A should be chosen over treatment B

CLASS 2a (MODERATE) — Benefit >> Risk

Suggested phrases for writing recommendations:
- Is reasonable
- Can be useful/effective/beneficial
- Comparative-Effectiveness Phrases†:
  - Treatment/strategy A is probably recommended/indicated in preference to treatment B
  - It is reasonable to choose treatment A over treatment B

CLASS 2b (Weak) — Benefit ≥ Risk

Suggested phrases for writing recommendations:
- May/might be reasonable
- May/might be considered
- Usefulness/effectiveness is unknown/unclear/uncertain or not well-established

CLASS 3: No Benefit (MODERATE) — Benefit = Risk

Suggested phrases for writing recommendations:
- Is not recommended
- Is not indicated/useful/effective/beneficial
- Should not be performed/administered/other

CLASS 3: Harm (STRONG) — Risk > Benefit

Suggested phrases for writing recommendations:
- Potentially harmful
- Causes harm
- Associated with excess morbidity/mortality
- Should not be performed/administered/other

LEVEL (QUALITY) OF EVIDENCE‡

LEVEL A
- High-quality evidence‡ from more than 1 RCT
- Meta-analyses of high-quality RCTs
- One or more RCTs corroborated by high-quality registry studies

LEVEL B-R (Randomized)
- Moderate-quality evidence‡ from 1 or more RCTs
- Meta-analyses of moderate-quality RCTs

LEVEL B-NR (Nonrandomized)
- Moderate-quality evidence‡ from 1 or more well-designed, well-executed nonrandomized studies, observational studies, or registry studies
- Meta-analyses of such studies

LEVEL C-LD (Limited Data)
- Randomized or nonrandomized observational or registry studies with limitations of design or execution
- Meta-analyses of such studies
- Physiological or mechanistic studies in human subjects

LEVEL C-EO (Expert Opinion)
- Consensus of expert opinion based on clinical experience.

COR and LOE are determined independently (any COR may be paired with any LOE).

A recommendation with LOE C does not imply that the recommendation is weak. Many important clinical questions addressed in guidelines do not lend themselves to clinical trials. Although RCTs are unavailable, there may be a very clear clinical consensus that a particular test or therapy is useful or effective.

* The outcome or result of the intervention should be specified (an improved clinical outcome or increased diagnostic accuracy or incremental prognostic information).

† For comparative-effectiveness recommendation (COR 1 and 2a; LOE A and B only), studies that support the use of comparator verbs should involve direct comparisons of the treatments or strategies being evaluated.

‡ The method of assessing quality is evolving, including the application of standardized, widely-used, and preferably validated evidence grading tools; and for systematic reviews, the incorporation of an Evidence Review Committee.

COR indicates Class of Recommendation; EO, expert opinion; LD, limited data; LOE, Level of Evidence; NR, nonrandomized; R, randomized; and RCT, randomized controlled trial.

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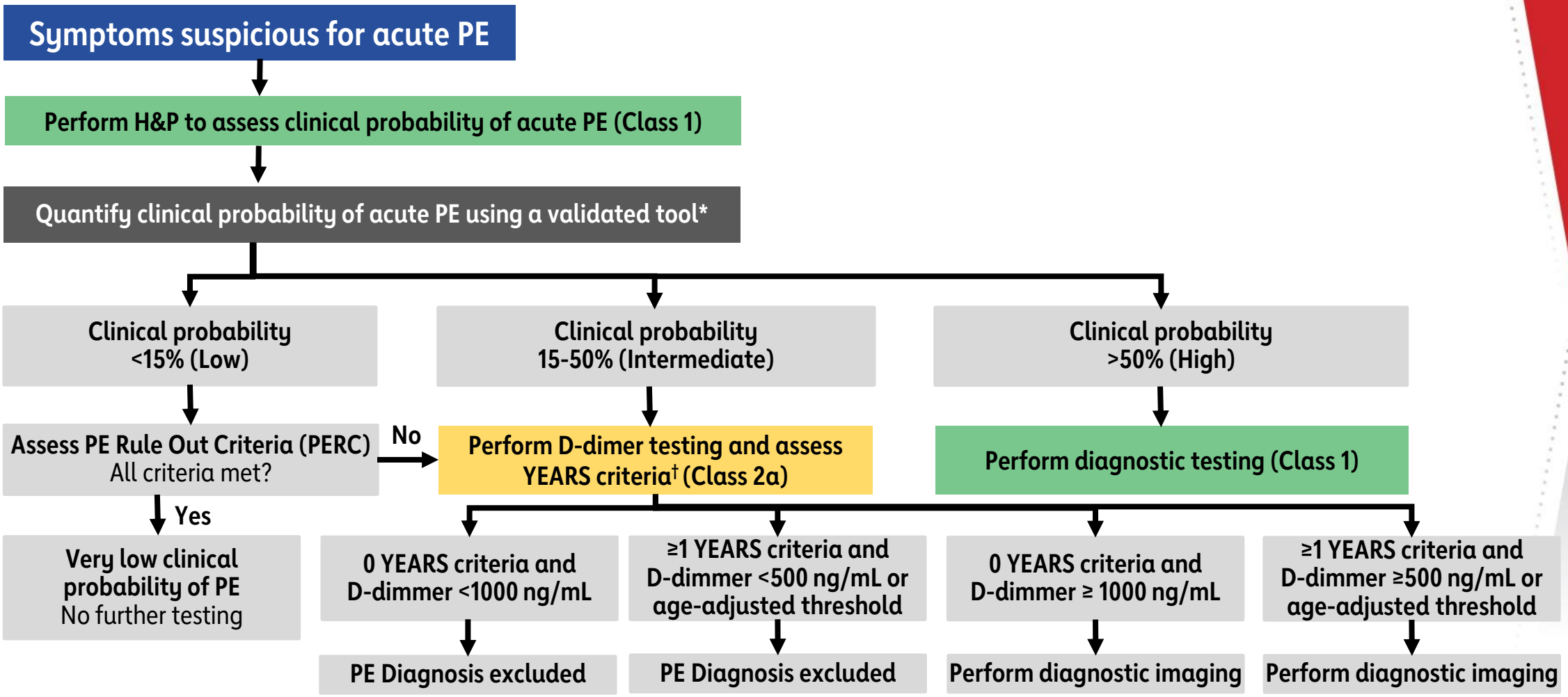
Clinical Evaluation of Patients with Suspected Acute PE



Abbreviations: DVT indicates deep vein thrombosis; and PE, pulmonary embolism.

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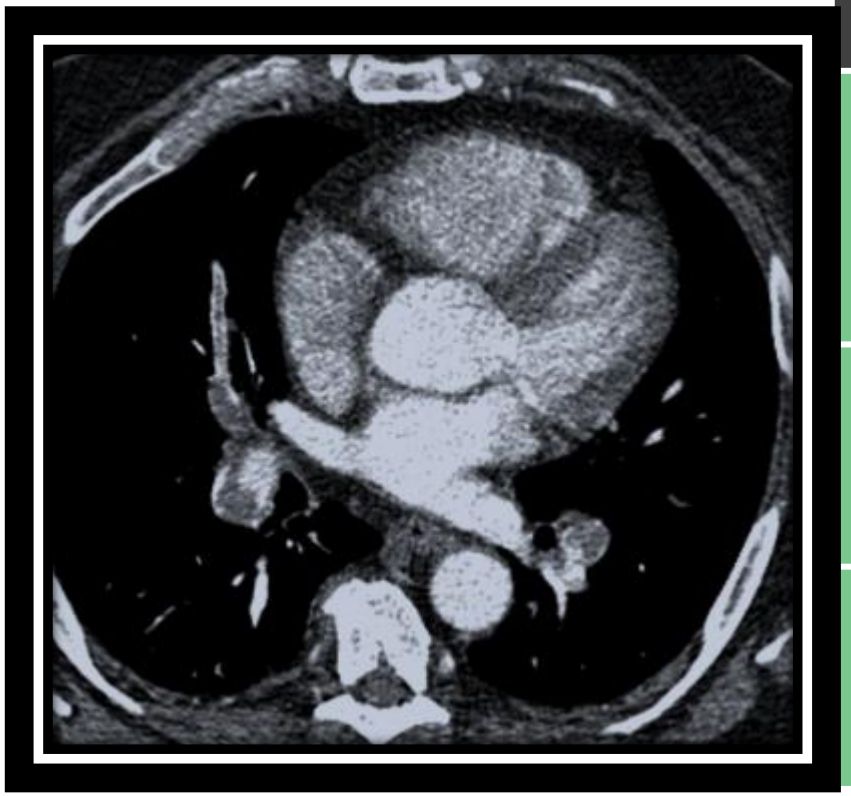
Diagnostic Testing



COR	RECOMMENDATIONS
1	In patients presenting with symptoms and signs suggestive of acute PE, imaging is recommended for those who are deemed high probability (>50% probability of PE) by a validated clinic risk prediction score or an elevated D-dimer level in order to confirm or exclude PE.
1	In patients undergoing imaging evaluation for suspected PE, a positive CTPA or high probability ventilation/perfusion (V/Q) scan is sufficient to diagnose PE.
1	In patients undergoing imaging evaluation, a CTPA is recommended in preference to a V/Q scan to confirm the diagnosis of acute PE.

Abbreviations: CTPA indicates Computed Tomography Pulmonary Angiogram; PE, Pulmonary embolism; and V/Q, ventilation/perfusion.

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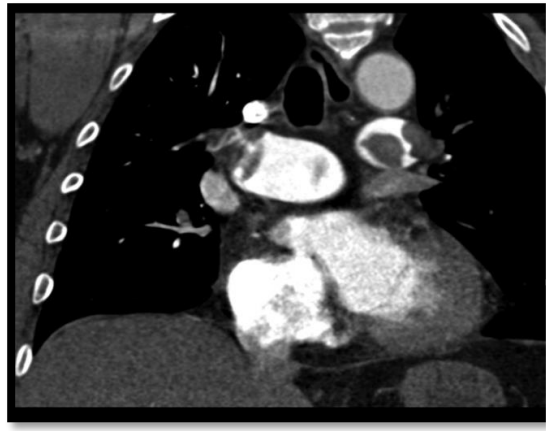
Diagnostic Testing – Reporting Findings



CTPA	
COR	**RECOMMENDATIONS**
1	In patients presenting with an acute PE who undergo CTPA, reporting Numerical RV/LV ratio (measured by internal diameter assessed on axial or reformatted 4D-chamber view) is recommended over subjective quantification for risk stratification
2b	In patients with acute PE, reporting of chronic features† on CTPA may be useful to identify patients at risk for chronic clinical sequelae of PE, including post-PE CTEPD Examples include: • intravascular webs • pulmonary artery retraction or dilation • bronchial artery dilation • RV hypertrophy • intraventricular septal flattening

TTE	
COR	**RECOMMENDATIONS**
1	In patients with acute PE who undergo transthoracic echocardiography, RV dysfunction should be assessed and reported by the following parameters: • RV/LV end-diastolic ratio • RV end-diastolic diameter • tricuspid annular plane systolic excursion (TAPSE) • Estimated right ventricular systolic pressure • RV free wall hypokinesis with sparing of the apex (McConnell's sign) • Tricuspid systolic velocity • Paradoxical septal motion • IVC respirophasic collapse

Abbreviations: CTEPD indicates Chronic Thromboembolic Pulmonary Disease; CTPA, Computed Tomography Pulmonary Angiography; IVC, inferior vena cava; LV, Left ventricle; PE, pulmonary embolism; RV, Right ventricle; and TTE, Transthoracic echocardiogram.

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AHA/ACC Acute PE Clinical Categories

A	B	C	D	E
Subclinical Incidental and asymptomatic	**Symptomatic** Low clinical severity score*	**Symptomatic** Elevated clinical severity score†	**Incipient Cardiopulmonary Failure**	**Cardiopulmonary Failure**

Lowest risk → Highest risk

		B1	Subsegmental (Single/multiple)	C1	Normal RV and normal biomarkers	D1	Transient hypotension‡	E1	Recurrent of persistent hypotension with cardiogenic shock
		B2	Non-Subsegmental	C2	Abnormal RV or ≥1 abnormal biomarkers	D2	Normotensive shock§	E2	Refractory cardiogenic shock or cardiac arrest
				C3	Abnormal RV and ≥1 abnormal biomarkers				
				+/-		+/-		+/-	
				R	**Respiratory Modifier** (O_2<90%, RR≥30, need supplemental O_2)	R	**Respiratory Modifier** (>6 L nasal cannula or use of NRB mask)	R	**Respiratory Modifier** (Hypoxemic respiratory failure or ventilatory failure)

Abbreviations: ACC indicates American College of Cardiology; AHA, American Heart Association; CPES, Composite Pulmonary Embolism Shock; IV, intravenous; NC, nasal cannula; NRB, nonrebreather; O2, oxygen; PE, pulmonary embolism; PESI, Pulmonary Embolism Severity Index; RR, respiratory rate; RV, right ventricle; and sPESI, simplified PESI.

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Initial Assessment and Management by AHA/ACC Acute PE Clinical Categories

Category A Subclinical	Category B Symptomatic, Low Clinical Severity Score	Category C1 Symptomatic, Elevated Clinical Severity Score	Category C2 Symptomatic, Elevated Clinical Severity Score	Category C3 Symptomatic, Elevated Clinical Severity Score	Category D1 Incipient Cardiopulmonary Failure	Category D2 Incipient Cardiopulmonary Failure	Category E1 Cardiopulmonary Failure	Category E2 Cardiopulmonary Failure
Initiate DOAC (1)		Initiate LMWH (1)						Initiate LMWH or UFH (1)
Use HESTIA, PESI and/or sPESI to assess short-term risk (1)		Measure at least 1 cardiac biomarker (1)						
		Measure lactate (1)						
		Evaluate RV size and function with CT and/or echo (1)						VA-ECMO (2a)
Use decision tool to identify suitability for outpatient treatment (2a)		Use validated risk score to identify higher-risk patient (2a)				Evaluate for normotensive shock (2a)		
		Multidisciplinary PERT assessment to guide clinical management (1)						
						Vasopressor and/or inotropic therapy (1)		
					Systemic Thrombolysis (if acceptable bleeding risk), CDL, MT in appropriate cases. (2b)		Systemic Thrombolysis (if acceptable bleeding risk), CDL, MT, or surgical embolectomy. (2a)	Systemic Thrombolysis (if acceptable bleeding risk). (2a)

Abbreviations: ACC indicates American College of Cardiology; AHA, American Heart Association; CDL, catheter-directed thrombolysis; COR, class of recommendation; CT, computed tomography; DOAC, direct oral anticoagulant; ECMO, extracorporeal membrane oxygenation; LMWH, low-molecular-weight heparin; MT, mechanical thrombectomy; PE, pulmonary embolism; PERT, PE response team; PESI, Pulmonary Embolism Severity Index; RV, right ventricle; sPESI, simplified PESI; UFH, unfractionated heparin; and VA, venoarterial.

Placement in the Hospital

COR	RECOMMENDATIONS
1	In patients with acute PE who are receiving thrombolytic therapy (systemic or CDL), placement in a unit that can provide close monitoring, such as an intensive care unit (ICU) or intermediate level of care unit, is recommended to monitor for adverse events.
2a	In patients admitted to the hospital with acute PE who undergo mechanical thrombectomy (MT) and are hemodynamically stable, admission to a level of care that can provide continuous telemetry and nursing care familiar with the postprocedural complications of the device used is reasonable.

Abbreviations: CDL indicates catheter directed thrombolysis; ICU, intensive care unit; MT, mechanical thrombectomy; and PE, pulmonary embolism.

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Pulmonary Embolism Response Team (PERT)

COR	RECOMMENDATIONS
1	In patients with acute PE who are at increased risk of adverse outcomes (ie, AHA/ACC PE Categories C-E)*, a multidisciplinary PERT assessment is recommended to improve in-hospital clinical care delivery.

**AHA/ACC PE Categories A or B with multiple comorbidities may also benefit from a PERT (eg, Category B with intracranial hemorrhage).*

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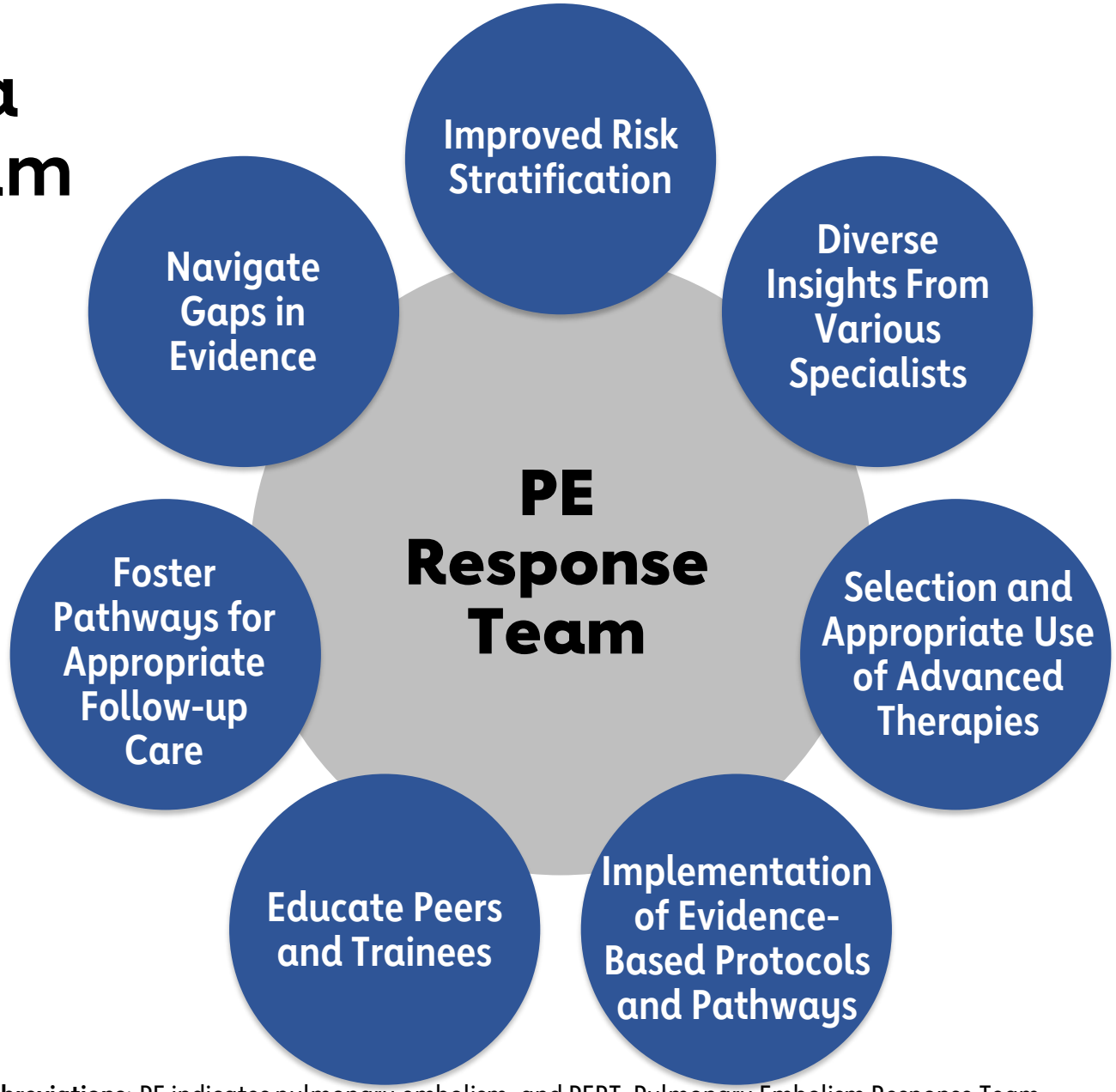
Benefits of a PERT Program


PE Response Team
Improved Risk Stratification
Diverse Insights From Various Specialists
Selection and Appropriate Use of Advanced Therapies
Implementation of Evidence-Based Protocols and Pathways
Educate Peers and Trainees
Foster Pathways for Appropriate Follow-up Care
Navigate Gaps in Evidence

Abbreviations: PE indicates pulmonary embolism; and PERT, Pulmonary Embolism Response Team.

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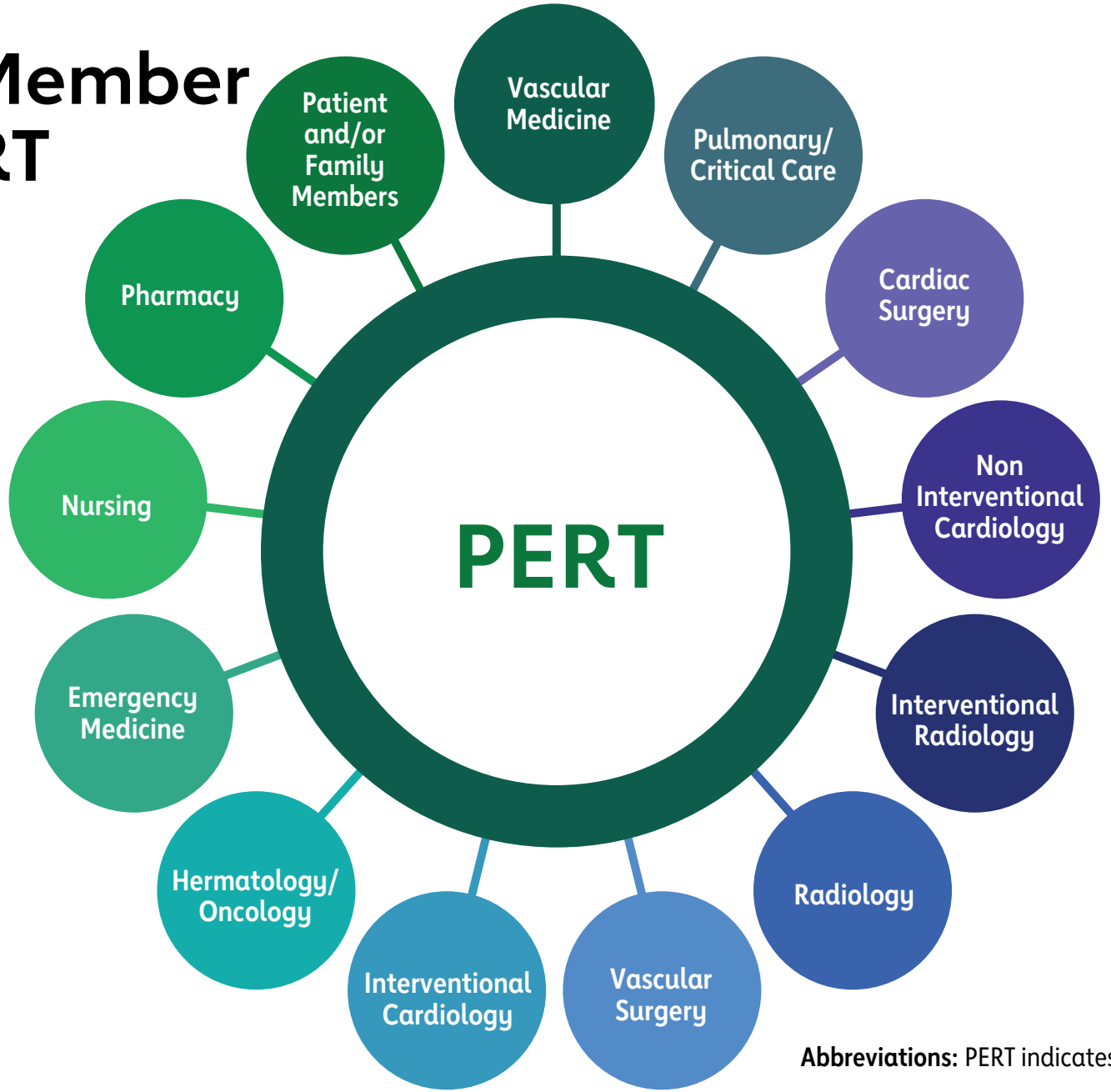
Possible Member of the PERT



Abbreviations: PERT indicates Pulmonary Embolism Response Team.

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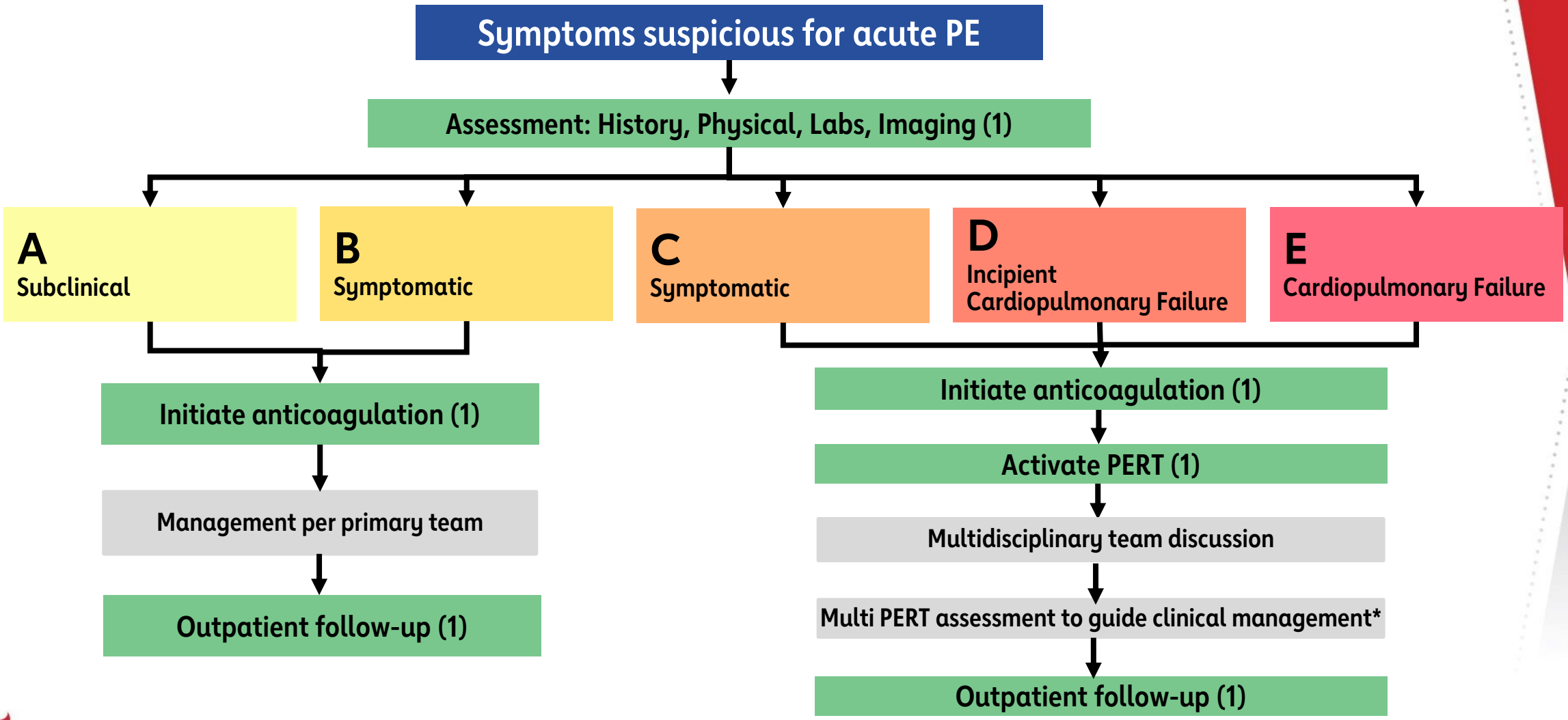
PERT Activation Example



Abbreviations: PE indicates pulmonary embolism; PERT, Pulmonary Embolism Response Team.

Anticoagulation Therapy – General Recommendations

COR	RECOMMENDATIONS
1	In patients with acute PE who do not have an absolute contraindication to anticoagulation therapy, anticoagulation therapy should be initiated to reduce the risk of recurrent VTE and death.
1	In patients with acute PE in AHA/ACC Categories C1-E1 who require parenteral anticoagulant therapy initially, LMWH is recommended over UFH to reduce recurrent VTE and major bleeding.
1	In patients with acute PE who are eligible for oral anticoagulation, direct oral anticoagulants (DOACs) are recommended over Vitamin K antagonists (VKAs), unless contraindicated, to prevent recurrent VTE and reduce major bleeding
2a	In patients with suspected acute PE in AHA/ACC PE Category C2 or higher and in whom the bleeding risk is low, it may be beneficial to administer therapeutic anticoagulation when imaging is delayed or not immediately accessible

Abbreviations: ACC indicates American College of Cardiology; AHA, American Heart Association; COR, class of recommendation; DOAC, direct oral anticoagulant; LMWH, low-molecular-weight heparin; PE, pulmonary embolism; UFH, unfractionated heparin; and VKA, Vitamin K antagonists; and VTE, venous thromboembolism.

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Hemodynamic Pharmacotherapy

Cardiogenic shock due to PE

AHA/ACC PE Categories **D2-E2**

COR	RECOMMENDATIONS
1	The use of vasopressors and/or inotropes is recommended to improve cardiac output and systemic perfusion.

Concerns for reduced preload based on clinical assessment

AHA/ACC PE Categories **D1-2**

COR	RECOMMENDATIONS
2b	The use of volume management with normal saline or other volume expanders may be considered to improve cardiac output and blood pressure.

In patients with PE

AHA/ACC PE Categories **C2-E**

COR	RECOMMENDATIONS
2b	The use of inhaled pulmonary vasodilators may be considered to reduce RV afterload.

Abbreviations: ACC indicates American College of Cardiology; AHA, American Heart Association; COR, class of recommendation; DOAC, direct oral anticoagulant; LMWH, low-molecular-weight heparin; PE, pulmonary embolism; UFH, unfractionated heparin; and VKA, Vitamin K antagonists; and VTE, venous thromboembolism.

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Sedation and Ventilatory Strategies

COR	RECOMMENDATIONS
1	In patients with acute PE in AHA/ACC PE Categories C-E who require sedation for intubation, hemodynamic supportive therapies should be available to support the patient in the event the patient becomes unstable.
2a	For patients with acute PE and moderate-severe hypoxia, use of heated high-flow nasal cannula (HFNC) oxygenation rather than standard nasal cannula oxygenation can be beneficial to improve oxygenation.
3 HARM	In patients with acute PE in AHA/ACC PE Categories C-E, deep sedation and mechanical ventilation should not be performed, unless clinically indicated, in order to avoid hemodynamic collapse.

During acute PE:
Heart rate and systemic vascular resistance both increase to maintain systemic and myocardial perfusion due to RV dysfunction

Anxiolytic and analgesic medications can potentially eliminate the compensatory mechanism resulting in hemodynamic collapse

Abbreviations: ACC indicates American College of Cardiology; AHA, American Heart Association; HFNC, high-flow nasal cannula; and PE, pulmonary embolism.

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Mechanical Circulatory Support

COR	RECOMMENDATIONS
1	In patients with known or suspected acute PE on VA-ECMO, continuation of parenteral systemic anticoagulation is recommended in the absence of bleeding to prevent further thrombotic or embolic complications.
2a	In patients with acute, refractory cardiogenic shock as a result of known or suspected acute PE (AHA/ACC PE Category E2), it is reasonable to institute VA-ECMO, provided appropriate resources are available, to stabilize hemodynamics and improve oxygenation.
2b	In patients with acute PE in AHA/ACC PE Category E2 who are placed on VA-ECMO support, the usefulness of additional advanced therapies is not well established.

Abbreviations: ACC indicates American College of Cardiology; AHA, American Heart Association; PE, pulmonary embolism; and ECMO, extracorporeal membrane oxygenation..

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The Role of Inferior Vena Cava Filters

COR	RECOMMENDATIONS
2a	In patients with acute PE who cannot tolerate anticoagulation, IVC filters can be useful to reduce the short-term incidence of recurrent PE.
1	In patients with acute PE who cannot tolerate anticoagulation but in whom an IVC filter is deemed necessary, retrievable IVC filters are recommended over permanent filters to reduce the short-term incidence of recurrent PE while minimizing long-term adverse outcomes.
1	In patients with retrievable IVC filters, retrieval should be attempted as soon as the risk of PE has sufficiently decreased and anticoagulation tolerated in order to minimize the risk of long-term filter-related complications.
2a	In patients with indwelling IVC filters, the use of a structured follow-up program is reasonable to increase retrieval rates and detect complications.

COR	RECOMMENDATIONS
2b	In patients with recurrent PE despite optimal therapeutic anticoagulation who are in AHA/ACC PE Categories B-E, IVC filter placement may be considered to reduce the short-term incidence of additional recurrent PE.
2b	In patients with acute PE in AHA/ACC PE Categories D-E, and who are undergoing advanced interventions such as systemic thrombolysis, CDL, MT, or surgical embolectomy, the benefit of IVC filter placement is uncertain to reduce the short-term incidence of recurrent PE and mortality.
3 Harm	In patients with acute PE who are therapeutically anticoagulated, routine IVC filter placement should not be performed.

Abbreviations: ACC indicates American College of Cardiology; AHA, American Heart Association; CDL, catheter-directed thrombolysis; IVC, inferior vena cava; MT, mechanical thrombectomy; and PE, pulmonary embolism.

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Systemic Thrombolysis in Acute PE

In patients with acute PE and an acceptable bleeding risk, in whom advanced therapy is being considered…

COR	AHA/ACC PE CATEGORY	RECOMMENDATIONS
2a	E1-E2	Systemic thrombolysis and anticoagulation is reasonable over anticoagulation alone to **reduce mortality and recurrent PE**.
2b	D1-D2	Systemic thrombolysis and anticoagulation may be considered over anticoagulation alone to **prevent further clinical deterioration**
2b	C3	Systemic thrombolysis and anticoagulation over anticoagulation alone to prevent further clinical deterioration is **uncertain**.
2b		In patients with acute PE being treated with systemic thrombolysis, lower dose systemic thrombolytics may be considered to reduce the risk of bleeding
3 Harm	A1-C2	Systemic thrombolysis should not be used over anticoagulation alone due to **increased risk of major bleeding and intracranial hemorrhage**.

Abbreviations: ACC indicates American College of Cardiology; AHA, American Heart Association'; COR, class of recommendation; and PE, pulmonary embolism;

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Comparing Catheter-Directed Thrombolysis and Mechanical Thrombectomy

COR	AHA/ACC PE CATEGORY	Catheter-Directed Thrombolysis RECOMMENDATIONS	Mechanical Thrombectomy RECOMMENDATIONS
2a	E1	CDL plus anticoagulation is reasonable to **prevent further clinical deterioration and early mortality**.	It is reasonable to choose MT plus anticoagulation over anticoagulation alone to **prevent further clinical decompensation and acute mortality**.
2b	D1-E1	The efficacy of CDL over systemic thrombolysis is **unclear**	The efficacy of MT over systemic thrombolysis is **unclear, but MT may be considered over systemic thrombolysis to reduce major bleeding risks**.
2b	D1-D2	CDL plus anticoagulation may be considered to **prevent further clinical deterioration**.	MT plus anticoagulation may be considered to **prevent further clinical deterioration**.
2b	C2-C3	The benefit of CDL plus anticoagulation as compared to anticoagulation alone is **unclear**.	The benefit of MT plus anticoagulation as compared to anticoagulation alone is **unclear**.
3 No Benefit	A-C1	CDL is **not recommended** over anticoagulation alone for improving clinical outcomes or symptoms.	MT is **not recommended** over anticoagulation alone for improving clinical outcomes or symptoms.

Abbreviations: ACC indicates American College of Cardiology; AHA, American Heart Association'; COR, class of recommendation CDL , catheter-directed thrombolysis; PA, pulmonary artery; PE, pulmonary embolism.

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Surgical Embolectomy

COR	AHA/ACC PE CATEGORY	RECOMMENDATIONS
2a	E1	SE as compared to anticoagulation alone is reasonable to **prevent further clinical decompensation and acute mortality**.
2b	D1-D2	SE plus anticoagulation may be considered over anticoagulation alone to **prevent further clinical deterioration**.
2b	D1-E1	Benefits of SE to reduce short-term fatal/nonfatal clinical deterioration and improve long-term survival, functional, capacity, and quality of life over systemic thrombolysis is unclear, but embolectomy **may be considered** over systemic thrombolysis to reduce the risk of ICH.
3 No Benefit	A-C3	SE is **not recommended** over anticoagulation alone for improving clinical outcomes or symptoms.
3 No Benefit	E2	For those not on mechanical circulatory support, SE is **not recommended** over other advanced therapies for preventing short-term mortality.

Abbreviations: ACC indicates American College of Cardiology; AHA, American Heart Association'; COR, class of recommendation; SE, surgical embolectomy; and PE, pulmonary embolism.

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Summary of Advanced Therapy Recommendations

AHA/ACC PE Risk Outcomes Category	Systemic Lysis	CDL	MT	Surgery
A-C1	3-Harm A	3-NB C-EO	3-NB C-EO	3-NB C-EO
C2	3-Harm B-R	2B C-LD (unclear)	2B C-LD (unclear)	3-NB C-EO
C3	2B C-LD (unclear)	2B C-LD (unclear)	2B C-LD (unclear)	3-NB C-EO
D1-2	2B C-LD (may be considered)	2B B-NR (may be considered)	2B B-NR (may be considered)	2B C-LD (unclear)
E1	2A C-LD	2A C-LD	2A B-NR	2A B-NR
E2	2A C-LD	N/A	N/A	3-NB B-NR

Abbreviations: ACC indicates American College of Cardiology; AHA, American Heart Association; CDL, catheter-directed thrombolysis; and MT, mechanical thrombectomy.

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Recommendations for Follow-up Care After an Acute PE

COR	RECOMMENDATIONS
1	Follow-up within 1st Week after discharge to provide patient education, address barriers to anticoagulation therapy, ensure adherence to medications, and detect bleeding complications.
1	Follow-up at or before 3 Months after diagnosis to discuss duration of anticoagulation, review the need for further testing, and assess for persistent PE-related symptoms.
1	Asked about PE-related symptoms and functional limitations at every visit for at least 1 year to screen for CTEPD or other causes of dyspnea and functional limitation.
1	In those with a history of acute PE who remain on anticoagulation into the extended phase (beyond 3-6 months from diagnosis), periodic reassessment of the risk and benefits of continued anticoagulation is recommended to ensure the safety and efficacy of continuing anticoagulation.
2a	In patients with acute PE, the use of general or disease-specific questionnaires is reasonable to screen for anxiety and depression at follow-up visits.
2a	In select complex patients[+] with acute PE, it is reasonable to have follow-up care occur in a specialized PE clinic[†], if available, to optimize care.
2b	In patients who remain symptomatic 3 to 6 months after acute PE, it may be reasonable to obtain a performance test (SMWT, ISWT, ESWT) to quantify physical limitations and identify which patients require more extensive evaluation.

Abbreviations: CTEPD indicates chronic thromboembolic pulmonary disease; ESWT, endurance shuttle walking test ; ISWT, incremental shuttle walking test; PE, pulmonary embolism; SMWT, Six-minute walk test; and VTE, venous thromboembolism.

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Patient Activity and Travel

COR	RECOMMENDATIONS
2a	In patients recovering from acute PE, it is reasonable to encourage early ambulation rather than bed rest in order to reduce the risk of complications.
2a	In patients with a history of acute PE, use of compression stockings during long-haul (≥5 h) travel can be useful to lower the risk of DVT.
2b	In patients with a history of acute PE related to travel or immobility who are not currently receiving anticoagulation therapy, it may be reasonable to use a one-time prophylactic dose of an oral anticoagulant or a parenteral LMWH on the day of long-haul travel to reduce the risk of recurrent VTE.
2b	For patients recovering from acute PE in AHA/ACC PE Categories C2-E, it may be reasonable to restrict long-haul travel for 4 weeks after initiation of treatment or when symptoms have resolved to reduce risk of adverse events.

Abbreviations: LMWH indicates low molecular weight heparin; and PE, pulmonary embolism.

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Recommendations for Anticoagulation Therapy by Recurrence Risk

Anticoagulation beyond initial phase (3-6 months)	
COR	**RECOMMENDATIONS**
1	First acute PE and no major reversible risk factor, continuing anticoagulation beyond the initial treatment phase (3-6 months) into the extended treatment phase is beneficial to prevent recurrent VTE.
1	First acute PE due to a major reversible risk factor, stopping anticoagulation at the end of the initial treatment phase (3-6 months) is recommended over continuing anticoagulation into the extended treatment phase in order to optimize the net clinical benefit of recurrent VTE versus bleeding.
1	In patients with a first PE due to a persistent risk factor, continuing anticoagulation at the initial treatment phase (3-6 months) into the extended treatment phase is reasonable in order to prevent recurrent VTE.
1	For patients with a PE who are offered anticoagulation beyond the initial treatment phase (3-6 months) into the extended treatment phase, treatment with a DOAC, unless contraindicated, is recommended over a VKA to reduce the risk of bleeding.

Abbreviations: PE indicates pulmonary embolism, and VTE, venous thromboembolism.

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Recommendations for Anticoagulation Therapy by Recurrence Risk-continued

Anticoagulation beyond initial phase (3-6 months)	
COR	**RECOMMENDATIONS**
1	For patients with a PE and with cancer who are offered anticoagulation beyond the initial treatment phase (3-6 months) into the extended treatment phase, either a DOAC or LMWH is recommended over VKA to reduce the risk of recurrent VTE.
1	For patients with a PE and without cancer offered anticoagulation beyond the initial treatment phase (3-6 months) into the extended treatment phase, but have a contraindication to DOAC, VKA is recommended over aspirin or no therapy to reduce the risk of recurrent VTE.
1	For patients with a PE who are offered anticoagulation beyond the initial treatment phase (3-6 months) into the extended treatment phase, treatment with half-dose apixaban or rivaroxaban is recommended to reduce the risk of bleeding.

Abbreviations: ASA indicates aspirin; DOAC, direct oral anticoagulant; LMWH, low-molecular-weight heparin; VKA, vitamin K antagonist; and VTE, venous thromboembolism.

Creager, M.A., et al. 2026 AHA/ACC/ACEP/CHEST/SCAI/SHM/SIR/SVM/SVN Guideline for Evaluation and Management of Acute Pulmonary Embolism in Adults. *Circulation*.

Recurrent Pulmonary Embolism

Symptoms suggestive of PE

COR	RECOMMENDATIONS
1	In patients with a history of PE and who present with new symptoms and signs suggestive of recurrent or breakthrough PE, radiographic imaging with a CTPA or V/Q scan is recommended to objectively confirm or exclude the diagnosis.

Documented Recurrent PE

COR	RECOMMENDATIONS
1	In patients with a history of PE who have a documented recurrent PE despite being treated with an anticoagulant, an evaluation is recommended to detect clinical and pharmacological factors that may contribute to recurrent PE.

Recurrent PE
Adherent to therapy

COR	RECOMMENDATIONS
2a	Change to alternative drug class rather than continuing therapy with the same drug is reasonable.

Documented Recurrent Acute PE
Adherent with reduced dose of DOAC

COR	RECOMMENDATIONS
2a	It is reasonable to increase to full dose of DOAC in the same class.

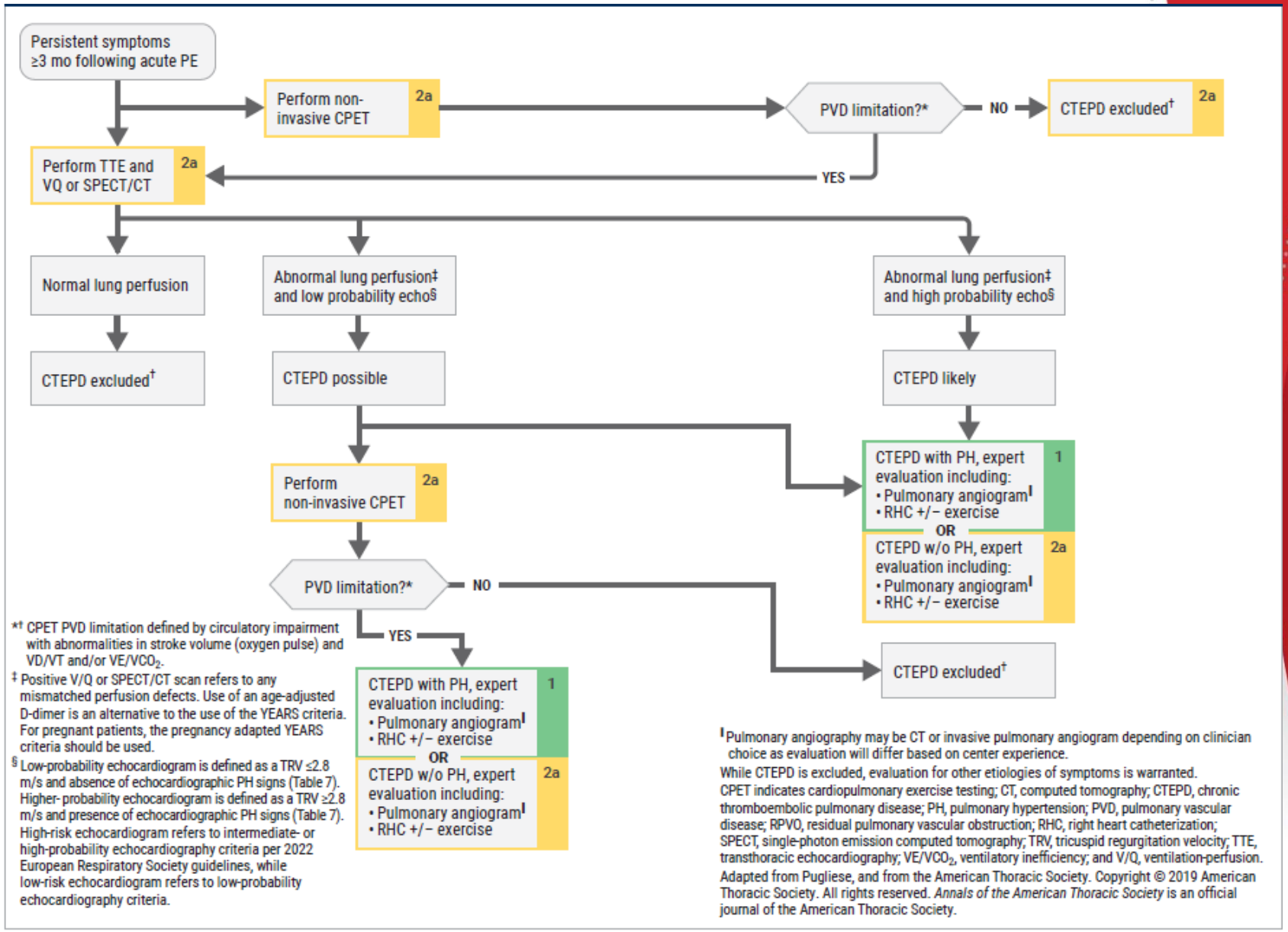
Cancer and Recurrent PE
Adherent to Therapeutic LMWH

COR	RECOMMENDATIONS
2a	Escalattion dose of LMWH by 20-25% is reasonable to prevent future recurrent PE.

Abbreviations: CTPA indicates computed tomography pulmonary angiography; DOAC, direct oral anticoagulant; LMWH, low-molecular-weight heparin; and V/Q, ventilation/perfusion.

Creager, M.A., et al. 2026 AHA/ACC/ACEP/CHEST/SCAI/SHM/SIR/SVM/SVN Guideline for Evaluation and Management of Acute Pulmonary Embolism in Adults. *Circulation*.

Revaluating Ongoing Symptoms Following Acute PE


Persistent symptoms ≥3 mo following acute PE
Perform non-invasive CPET
2a
PVD limitation?*
NO
CTEPD excluded†
2a
Perform TTE and VQ or SPECT/CT
2a
YES
Normal lung perfusion
Abnormal lung perfusion‡ and low probability echo§
Abnormal lung perfusion‡ and high probability echo§
CTEPD excluded†
CTEPD possible
CTEPD likely
Perform non-invasive CPET
2a
CTEPD with PH, expert evaluation including:
• Pulmonary angiogram‖
• RHC +/− exercise
1
OR
CTEPD w/o PH, expert evaluation including:
• Pulmonary angiogram‖
• RHC +/− exercise
2a
PVD limitation?*
NO
YES
CTEPD with PH, expert evaluation including:
• Pulmonary angiogram‖
• RHC +/− exercise
1
OR
CTEPD w/o PH, expert evaluation including:
• Pulmonary angiogram‖
• RHC +/− exercise
2a
CTEPD excluded†
*† CPET PVD limitation defined by circulatory impairment with abnormalities in stroke volume (oxygen pulse) and VD/VT and/or VE/VCO2.
‡ Positive V/Q or SPECT/CT scan refers to any mismatched perfusion defects. Use of an age-adjusted D-dimer is an alternative to the use of the YEARS criteria. For pregnant patients, the pregnancy adapted YEARS criteria should be used.
§ Low-probability echocardiogram is defined as a TRV ≤2.8 m/s and absence of echocardiographic PH signs (Table 7). Higher-probability echocardiogram is defined as a TRV ≥2.8 m/s and presence of echocardiographic PH signs (Table 7). High-risk echocardiogram refers to intermediate- or high-probability echocardiography criteria per 2022 European Respiratory Society guidelines, while low-risk echocardiogram refers to low-probability echocardiography criteria.
‖ Pulmonary angiography may be CT or invasive pulmonary angiogram depending on clinician choice as evaluation will differ based on center experience.
While CTEPD is excluded, evaluation for other etiologies of symptoms is warranted.
CPET indicates cardiopulmonary exercise testing; CT, computed tomography; CTEPD, chronic thromboembolic pulmonary disease; PH, pulmonary hypertension; PVD, pulmonary vascular disease; RPVO, residual pulmonary vascular obstruction; RHC, right heart catheterization; SPECT, single-photon emission computed tomography; TRV, tricuspid regurgitation velocity; TTE, transthoracic echocardiography; VE/VCO2, ventilatory inefficiency; and V/Q, ventilation-perfusion.
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